



STPS2545CT/CG/CFP

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 12.5 A
V_{RRM}	45 V
T_j (max)	175 °C
V_F (max)	0.57 V

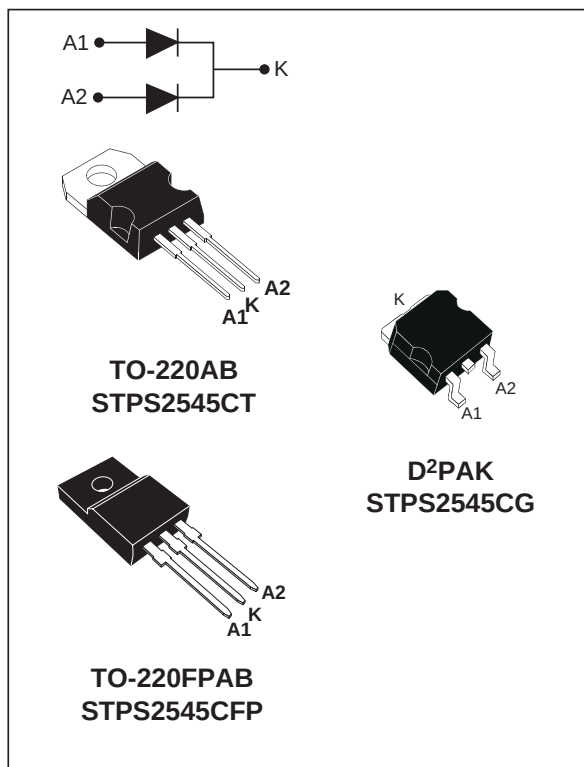
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Dual center tap Schottky rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters.

This device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit
V _{RRM}	Repetitive peak reverse voltage				45	V
I _{F(RMS)}	RMS forward current				30	A
I _{F(AV)}	Average forward current δ = 0.5	TO-220AB D ² PAK	Tc = 160°C	Per diode	12.5	A
		TO-220FPAB	Tc = 140°C	Per device	25	
I _{FSM}	Surge non repetitive forward current		tp = 10 ms sinusoidal		200	A
I _{RRM}	Repetitive peak reverse current		tp = 2 μs square F = 1kHz		1	A
I _{RSM}	Non repetitive peak reverse current		tp = 100 μs square		2	A
P _{ARM}	Repetitive peak avalanche power		tp = 1μs Tj = 25°C		4800	W
T _{stg}	Storage temperature range				-65 to +175	°C
Tj	Maximum operating junction temperature *				175	°C
dV/dt	Critical rate of rise of reverse voltage				10000	V/μs

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

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THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to ambient	TO-220AB / D ² PAK	Per diode	1.6	°C/W
		TO-220FPAB		4	
		TO-220AB / D ² PAK	Total	1.1	°C/W
		TO-220FPAB		3.5	
$R_{th(c)}$		TO-220AB / D ² PAK	Coupling	0.6	°C/W
		TO-220FPAB		3	

When the diodes 1 and 2 are used simultaneously :

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage Current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			125	μA
		$T_j = 125^\circ\text{C}$			9	25	mA
V_F^*	Forward Voltage drop	$T_j = 125^\circ\text{C}$	$I_F = 12.5\text{ A}$		0.50	0.57	V
		$T_j = 25^\circ\text{C}$	$I_F = 25\text{ A}$			0.84	
		$T_j = 125^\circ\text{C}$	$I_F = 25\text{ A}$		0.65	0.72	

Pulse test : * $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.012 \times I_F^2(\text{RMS})$$

Fig. 1: Conduction losses versus average current.

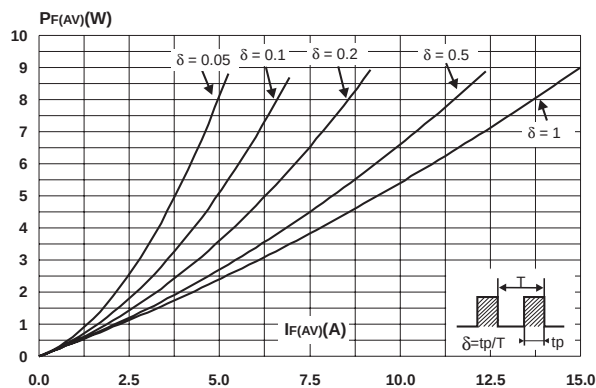


Fig. 3: Normalized avalanche power derating versus pulse duration.

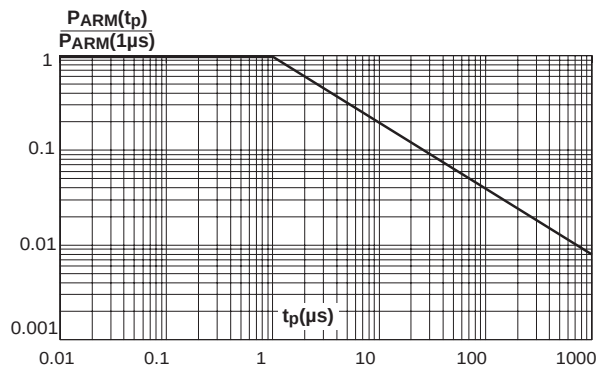


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$).

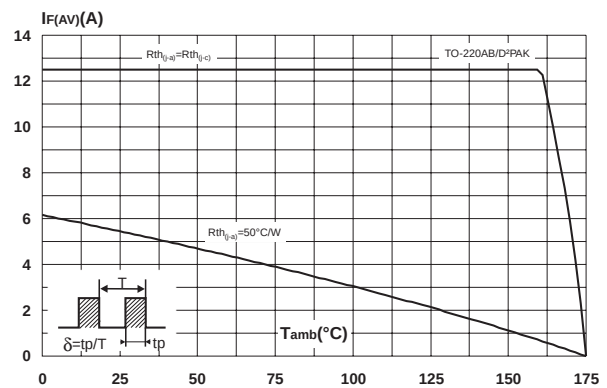


Fig. 4: Normalized avalanche power derating versus junction temperature.

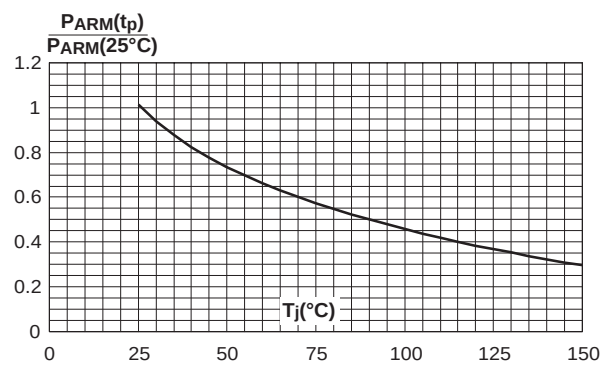


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AB, D²PAK).

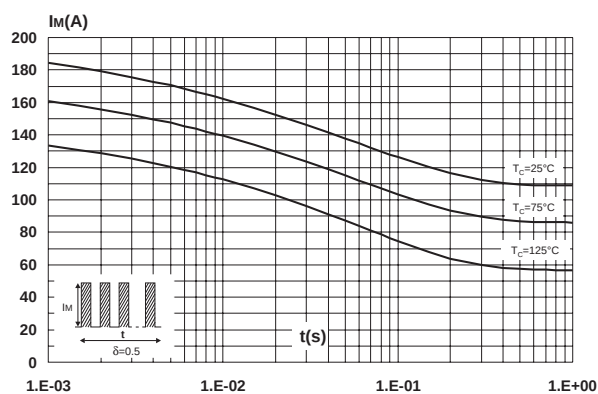


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220FPAB).

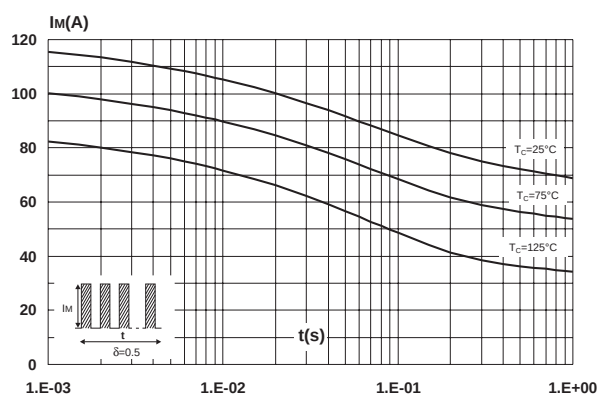


Fig. 6-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB, D²PAK).

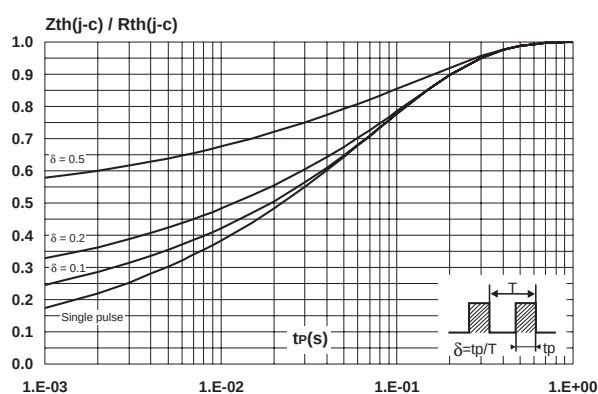


Fig. 6-2: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAB).

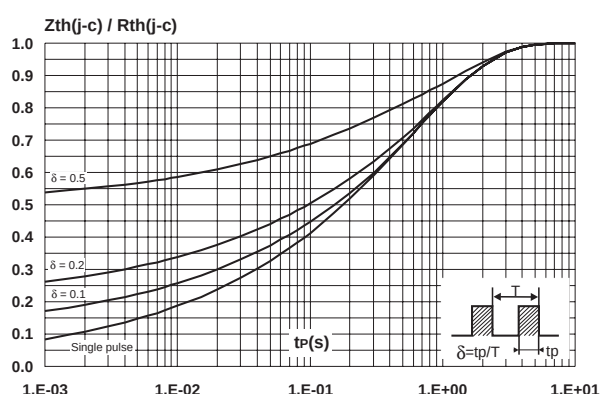


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

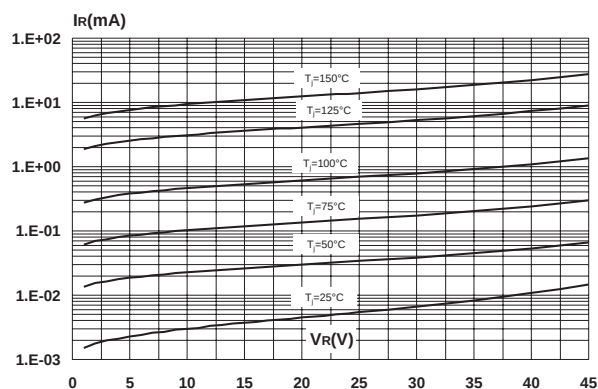


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

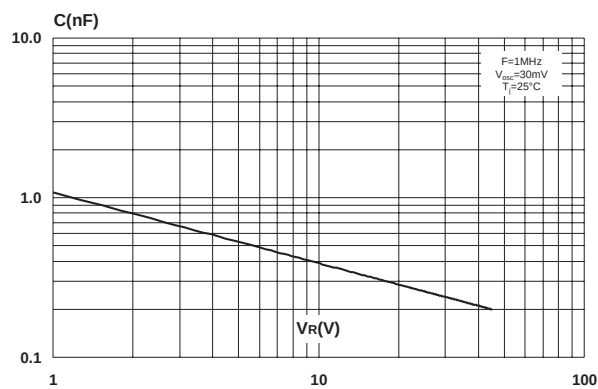


Fig. 9: Forward voltage drop versus forward current.

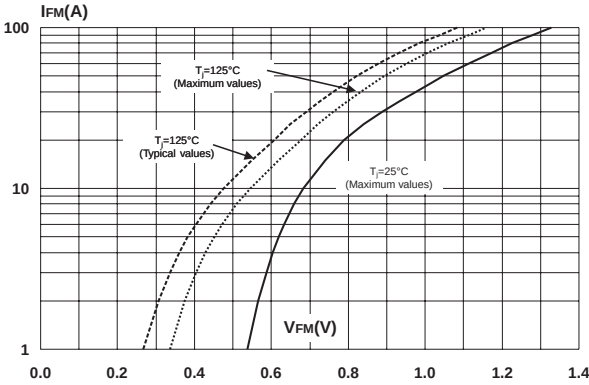
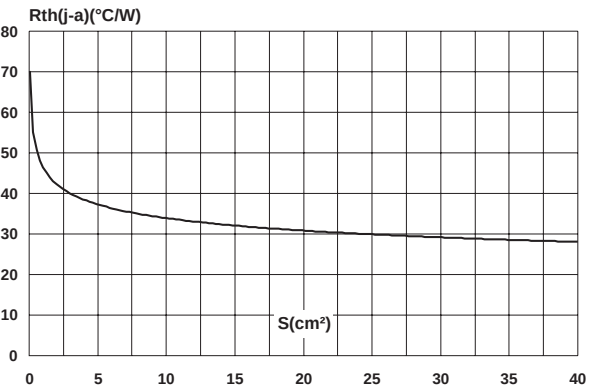
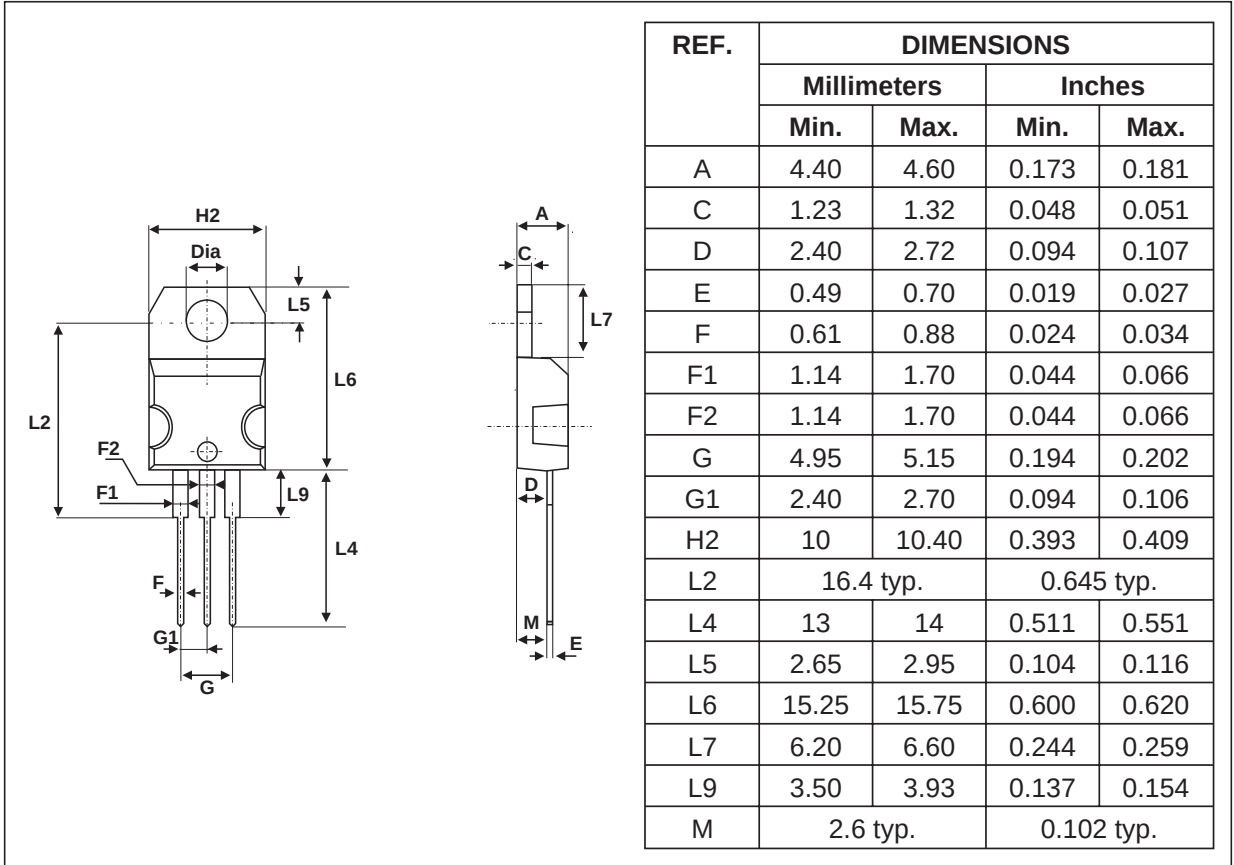


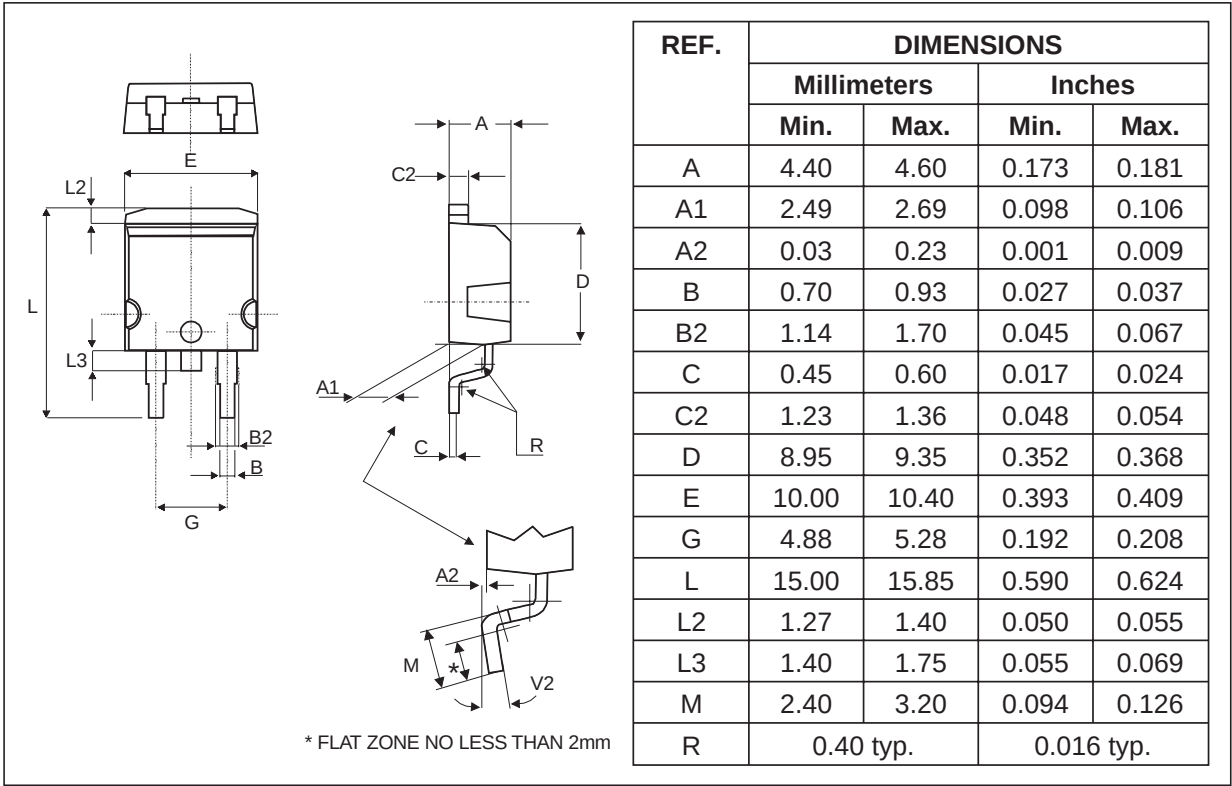
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35μm).



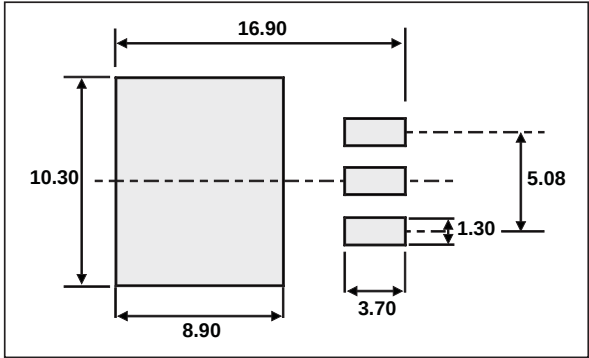
PACKAGE MECHANICAL DATA
TO-220AB



PACKAGE MECHANICAL DATA
D²PAK



FOOTPRINT



PACKAGE MECHANICAL DATA
 TO-220FPAB

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS2545CT	STPS2545CT	TO-220AB	2.20 g	50	Tube
STPS2545CFP	STPS2545CFP	TO-220FPAB	2.0 g	50	Tube
STPS2545CG	STPS2545CG	D ² PAK	1.48 g	50	Tube
STPS2545CG-TR	STPS2545CG	D ² PAK	1.48 g	1000	Tape & reel

■ EPOXY MEETS UL94,V0

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